

FIBER REINFORCED CEMENT COMPOSITE MATERIALS

USING CHEMICALLY TREATED FIBERS WITH IMPROVED DISPERSIBILITY

Abstract of the Disclosure

A fiber-reinforced building material in one embodiment incorporates cellulose fibers that are chemically treated with a dispersant to impart improved dispersibility to the fibers. The fibers are treated with a dispersant which deactivates the hydroxyl sites of the fiber surfaces and in some cases, making the fiber surface more hydrophobic. The dispersant inhibits the hydroxyl groups on the cellulose fiber surface from bonding with hydroxyl groups of other fibers and from bonding with hydroxyl groups of the same fiber, thereby significantly reducing inter-fiber and intra-fiber hydrogen bonding. The treated fibers can be readily dispersed and uniformly distributed throughout a mixture without re-clustering or reclumping once the mechanical mixing action stops. The chemically treated fibers with improved dispersibility improve the fiber distribution and reinforcing efficiency, which in turn improves key physical and mechanical properties of the material such as the modulus of rupture, z-direction tensile strength, and toughness, and surface finishes. With improved fiber reinforcing efficiency, less dosage of fiber is needed to achieve the required physical and mechanical properties.

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